

REMARKS

In the Office Action, the Examiner rejected independent claim 8 under 35 U.S.C. §103(a) as being unpatentable over the Canfield patent in view of the Hrovat patent.

Independent claim 8 is directed to a gas discharge tube comprising a block, a cathode, and an anode. At least a portion of the block is maintained at a reference potential. The cathode engages the block and is biased at a lower potential than the reference potential. The anode engages the block and is biased at a higher potential than the reference potential. The reference potential is substantially ground.

The Canfield patent discloses a ring laser gyroscope 10 including a frame 12 that has four mounting faces 14-17 at its corners. Mirrors 18-21 are mounted on the mounting faces 14-17. A cavity 22 in the frame 12 forms a rectangular path around the frame 12 between the mirrors 18-21. A gain medium fills the cavity 22 and, when electrically excited, produces counterpropagating light beams 26 and 28 in the cavity 22. A plasma discharge is confined to a region 24 of the cavity 22. Energy is delivered to the gain medium by a power supply

(not shown) which applies suitable voltages to a pair of anodes 32 and 34 and to a cathode 36.

A mounting device 46 is placed centrally in the frame 12. The mounting device 46 includes a plurality of bores 52 that receive fasteners such as bolts (not shown) to fasten the frame 12 to a case (not shown). The mounting device 46 is connected to electrical ground.

A barrier ring 58 is placed between the mounting device 46 and the frame 12. The ring 58 is formed of an electrically insulating material to prevent charge flow between the metal mounting device 46 and the frame 12. The barrier ring 58, therefore, prevents the flow of ions in the frame 12 to the plasma region of the cavity. The barrier ring 58 provides a high resistivity barrier between the frame 12 and the grounded mounting device 46, thereby limiting the migration of mobile ions in the frame 12.

As can be seen, the Canfield patent does not disclose the cathode and anode potentials as recited in independent claim 8. Therefore, the Examiner cites the Hrovat patent.

The Hrovat patent discloses a ring laser gyro 10 having a cathode 12 connected to a negative terminal 22 of a high voltage electric potential source 20, a

first anode 14 connected to a positive terminal 24 of the high voltage electric potential source 20 through resistors R1 and R2, and a second anode 16 connected to the positive terminal 24 of the high voltage electrical potential source 20 through resistors R3 and R4.

A low voltage power supply 70 has a positive terminal 71 coupled to the positive terminal 24 of the high voltage electrical potential source 20, and a negative terminal 72 connected to ground. The positive terminal 71 is also connected to other circuit components such as an operational amplifier 30 (not shown).

The junction between the resistors R1 and R2 is connected to an input 32 of a comparator 30 through a resistor R5, and the junction between the resistors R3 and R4 is also connected to the input 32 through a resistor R6. The comparator 30 is a summing amplifier having a negative input connected to the input 32 and a positive input connected to V_{ref} through an input 34. An output 36 of the comparator 30 has a voltage that is proportional to the voltage difference between the inputs 32 and 34.

The output 36 is connected to an input 52/252 of a current control circuit 50/250 through an electrical isolation circuit 40/240. The electrical isolation

circuit 40/240 isolates the low voltage circuit at the output 36 of the comparator 30 from the high voltage current control circuit 50/250.

The input signal connected to the input 32 of the comparator 32 represents the total electrical current through the electrode 12. The output 36 of the comparator 30 provides a command signal representative of the difference in voltages between inputs 32 and 34. The command signal is electrically connected to the input 52/252 of the current control circuit 50/250 through the electrical isolation circuit 40/240 in order to control the current passing into and out of current control circuit terminal 54/254. In closed-loop operation, the combination of the comparator 30 and the current control circuit 50/250 serve to maintain a constant current through the electrode 12.

The Hrovat patent does not disclose a potential for any part of the block of the ring laser gyro 10 and, as a result, does not disclose the relationship between the cathode/anode potentials and a block potential as recited in independent claim 8.

The Canfield patent suggests that the mounting device 46 is at electrical ground, but makes no

disclosure concerning the potentials of the cathode 36 and the anodes 32 and 34.

Moreover, neither the Canfield patent nor the Hrovat patent suggests biasing the cathode 36 of the Canfield patent at a potential that is lower than the ground potential of the mounting device 46 and biasing the anodes 32 and 34 of the Canfield patent at a potential that is higher than the ground potential of the mounting device 46.

Indeed, the Canfield patent is completely silent with respect to the potentials of the cathode 36 and the anodes 32 and 34.

Also, while the Hrovat patent discloses certain potentials for the cathode 12 and the anodes 14 and 16, neither the Canfield patent nor the Hrovat patent discloses any considerations that would have lead one of ordinary skill in the art to provide potentials for the cathode 36 and the anodes 32 and 34 of the Canfield patent in accordance with the limitations of independent claim 8.

The Examiner opines that providing potentials for the cathode 36 and the anodes 32 and 34 disclosed in the Canfield patent with the potentials recited in independent claim 8 would have been to the benefit of the

gas discharge tube. However, the Examiner does not state what that benefit is. The present application discloses a benefit. However, neither the Canfield patent nor the Hrovat patent discloses or suggests this benefit.

Indeed, neither the Canfield patent nor the Hrovat patent discloses or suggests any benefit that would have lead one of ordinary skill in the art to the invention of independent claim 8.

Consequently, independent claim 8 is not unpatentable over the Canfield patent in view of the Hrovat patent.

CONCLUSION

In view of the above, the claims of the present application patentably distinguish over the art applied by the Examiner. Accordingly, allowance of these claims and issuance of the present application are respectfully requested.

Respectfully submitted,

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